

22. The Role of Tourniquet Augmentation In The Preoperative Mapping Of Upper Extremity Superficial Vein Diameter: Prospective Comparison In Patients With End Stage Renal Disease and In Normal Controls

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OBJECTIVES: Preoperative assessment of the upper extremity veins is crucial for the planning of a successful arteriovenous fistula. The role of tourniquet augmentation in vein mapping is not well known.

METHODS: Data were collected prospectively on 14 consecutive patients with end stage renal disease in need of a hemodialysis access (age: 61 ± 15 yrs, range 38-86, 10 males). A comparison group consisted of 30 healthy volunteers (age: 31 ± 12 yrs, range 19-61, 13 males). The minimal vein diameter was recorded in each of the following segments (upper arm cephalic, forearm cephalic, wrist cephalic, and arm basilic), before and following the application of a tourniquet. The baseline values as well as changes following tourniquet augmentation were compared between the various segments in both study groups and trends and associations were examined using paired t-test, correlation analysis and ANOVA.

RESULTS: Tourniquet augmentation resulted in an overall increased vein diameter on paired analysis (mean difference 0.47, $P < 0.0001$). However, there was poor correlation between venous distendability and the age and gender of the patient. Lower mean distendability was noted in ESRD patients compared to normal controls (0.5 mm vs 0.38 mm), although the difference was not significant ($P = 0.09$). When the various venous segments were examined separately, the basilic and wrist cephalic segments were significantly smaller in the ESRD population (2.8 ± 1.2 mm vs 4.0 ± 1.3 mm, $P = 0.017$ and 6.5 ± 1.6 mm vs 4.8 ± 1.8 mm, $P = 0.006$, respectively). ANOVA showed that diameter change was least pronounced in the wrist segment of the cephalic vein ($P = 0.004$).

CONCLUSIONS: Although significant distention of the upper extremity veins occur with tourniquet application, these changes are limited in the ESRD population, especially for the cephalic vein at the wrist level. Uniform utilization of tourniquet during mapping may be of little value during screening examinations

